

Nearly 25 per cent of the stations reporting were without rain. The heaviest 24-hour rainfall was 2.59 inches, at Squirrel Inn.

SNOWFALL.

The month was practically without snow. It is not unusual to have some snow flurries and light falls during September; but the present month was without snow, except at the higher elevations.

SUNSHINE.

The following table gives the total hours of sunshine and percentages of possible:

Stations.	Hours.	Percent- age of possible.	Stations.	Hours.	Percent- age of possible.
Eureka.....	180	48	Sacramento.....	321	86
Fresno.....	305	82	San Diego.....	282	76
Los Angeles.....	292	79	San Francisco.....	222	59
Mount Tamalpais.....	297	80	San Jose.....	312	84
Red Bluff.....	321	86	San Luis Obispo.....	270	73

NOTES ON THE RIVERS OF THE SACRAMENTO AND SAN JOAQUIN WATERSHEDS FOR SEPTEMBER, 1911.

By N. R. TAYLOR, Local Forecaster.

SACRAMENTO WATERSHED.

There was little departure from the low stages that usually occur in this watershed during the month, although the run-off of all streams was somewhat above that of the corresponding month of 1910. At Sacramento the lowest stages of the month, 5.5 feet, occurred from the 13th to 17th, inclusive; after the last-named date the effect of the tides was noted in the river for some distance above the mouth of the American.

The rainfall was deficient generally, light showers having occurred only in the upper Sacramento Valley and in the Feather-Yuba territory, and in no case was the rainfall sufficient to appreciably affect the run-off.

Sand bars formed in the river in the vicinity of Sacramento at various times during the month, causing the grounding of some of the smaller craft, but there were few prolonged interruptions to navigation.

SAN JOAQUIN WATERSHED.

Light showers occurred during the month at most of the river stations in this watershed, but only in the upper reaches of the Tuolumne, Stanislaus, Mokelumne, and Cosumnes Rivers was there a measurable amount of rainfall. All watercourses in the San Joaquin Valley carried considerably more water than for any September during the past three or four years. This was notably so in the San Joaquin above the mouth of the Merced, and in the Stanislaus and Merced Rivers, which showed the greatest September discharges of which there is record.

WEATHER IN THE SAN JOAQUIN VALLEY.

By W. E. BONNETT, Local Forecaster.

September was a cool month, with the mean 4.5° below the normal. A maximum of 99° was recorded on the 1st, and the temperature rose above 90° on eight days. On a number of dates it was not above 80° . This is an unusual condition for September, and unfavorable for fruit drying.

Traces of rain fell on the 21st and 28th, and 0.01 inch was recorded on the 29th. The normal monthly rainfall is 0.27 inch.

The month as a whole was unfavorable for raisin curing, the chief agricultural interest at this season. A

setback given to the grapes in the spring by frost and unusually cool weather in August and September delayed the ripening season two weeks. There has been none of the warm weather that normally occurs in September and which is counted upon for proper raisin curing. Picking in average seasons is completed during the first 10 days of the month, but this year a great many first-crop grapes were not picked on the 20th. From the 20th to the close of the month drying conditions were most unfavorable. Cloudy, threatening days alternated with clear days, but conditions did not warrant complete unstacking at any time after the 20th and what drying weather occurred during that time was lost.

VARIATION OF RAINFALL WITH ALTITUDE.

By A. G. MCADIE.

Through the courtesy of Mr. J. Crawford, superintendent of San Joaquin Light and Power Corporation, records of rainfall at four stations near Fresno, for the seasonal years 1909-10 and 1910-11, have been sent to the editor for discussion.

The stations are:

	Feet.
1. Fresno, elevation.....	230
2. San Joaquin power house, elevation.....	1,013
3. Reservoir No. 1, elevation.....	2,441
4. C. V. Dam, elevation.....	3,500

The monthly amounts recorded are:

Months.	Season 1909-10.				Season 1910-11.			
	1	2	3	4	1	2	3	4
September.....	0.72	1.52	1.72	0.09	1.00	1.56	1.50	2.80
October.....	2.79	6.73	6.89	2.28	.45	1.05	1.77	1.92
November.....	4.50	9.03	10.24	7.52	.24	1.05	1.21	1.22
December.....	1.22	4.25	3.64	17.10	.21	1.63	1.50	1.83
January.....	.21	.35	.48	6.24	4.23	16.23	15.61	27.70
February.....	1.28	2.03	2.09	1.35	1.14	3.57	3.24	4.65
March.....	.27	1.07	1.18	2.84	3.30	9.32	8.97	14.26
April.....				1.77	1.03	2.56	2.70	5.68
May.....				.10	.22	.51	.62	.86
June.....								.12
July.....								
August.....								
Total.....	10.99	24.98	26.24	39.29	11.82	38.08	37.02	61.04

Combining the records and taking a mean we have an annual precipitation as follows:

230 feet, 11.40 inches.
1,013 feet, 31.53 inches.
2,441 feet, 31.63 inches.
3,500 feet, 50.16 inches.

or a gradient of 1.18 inches per 100 feet. It will be noted that for some reason not now apparent there is a very small increase between 1,013 feet and 2,441 feet, or, in other words, in this locality the increase is at the rate of 2.58 inches per 100 feet up to 1,000 feet.

In the July number of the Monthly Weather Review Mr. Charles Lee gives numerous diagrams showing the rate of increase of precipitation with elevation in various parts of California. Three sections of the Sierra are charted, the first known as the Central Pacific group, extending from Sacramento to Truckee; second, the Mokelumne section, extending from Stockton to Carson Lake, about 50 miles south of the first group, and third, the Tuolumne group, extending from Merced to the southern end of Walker Lake. The Fresno section then would constitute a fourth group, one still farther south. From all of them it appears that there is a definite increase in precipitation with elevation up to 5,000 feet, decreasing steadily above this. The average rate of increase is 8.5 inches per 1,000 feet up to 5,000 feet.